

# DISCRETE MATHEMATICS

## **Editor-in-Chief**

Peter L. Hammer, *RUTCOR, Rutgers, the State University of New Jersey, 640 Bartholomew Road, Piscataway, NJ 08854-8003, USA*

## **Advisory Editors**

A.J. Hoffman, *Mathematical Sciences Department, IBM Thomas Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598, USA*

V.L. Klee, *Department of Mathematics, University of Washington, Seattle, WA 98195, USA*

R.C. Mullin, *Department of Combinatorics & Optimization, University of Waterloo, Waterloo, Ont., Canada N2L 3G1*

V.T. Sós, *Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences, POB 127, H-1364 Budapest, Hungary*

J.H. van Lint, *Technische Universiteit, Insulindelaan 2, 5612 AZ Eindhoven, Netherlands*

## **Board of Editors**

M.S. Aigner, *FB Mathematik, WE2, Freie Universität Berlin, Arnimallee 3, 14195 Berlin 33, Germany*

B. Alspach, *Department of Mathematics and Statistics, University of Regina, Regina, SK, Canada S4S 0A2*

G.E. Andrews, *Department of Mathematics & Statistics, Pennsylvania State University, University Park, PA 16802, USA*

A. Barlotti, *Istituto Matematico "Ulisse Dini", Viale Morgagni 67/A, I-50134 Firenze, Italy*

C. Benzaïen, *Institute of Advanced Mathematics, Scientific and Medical, University of Grenoble, BP 53X, 38041 Grenoble Cedex, France*

J.-C. Bermond, *Project SLOOP, I3S-INRIA, 2004 Route des Lucioles, BP 93, F-06902 Sophia-Antipolis, France*

N.L. Biggs, *Department of Mathematics, London School of Economics, Houghton Street, London WC2A 2AE, UK*

B. Bollobás, *Department of Mathematical Sciences, University of Memphis, Campus Box 526429, Memphis, TN 38152-6429, USA*

R.A. Brualdi, *Department of Mathematics, University of Wisconsin-Madison, 480 Lincoln Drive, Madison, WI 53706, USA*

T.H. Brylawski, *Department of Mathematics, University of North Carolina, Chapel Hill, NC 27514, USA*

P.J. Cameron, *School of Mathematical Sciences, Queen Mary College, University of London, Mile End Road, London E1 4NS, UK*

P. Camion, *Centre National de la Recherche Scientifique, Université Pierre et Marie Curie, UMR7090 Equipe Combinatoire, 175 rue du Chevaleret, 75013 Paris, France*

- G. Chartrand, *Department of Mathematics, Western Michigan University, Kalamazoo, MI 49008, USA*
- V. Chvátal, *Department of Computer Science, Rutgers, the State University of New Jersey, Hill Center, Piscataway, NJ 08855, USA*
- C.J. Colbourn, *Department of Computer Science and Engineering, Arizona State University, GWC 206, Tempe, AZ 85287, USA*
- D. Foata, *1 rue Murner, F-67000 Strasbourg, France*
- A.S. Fraenkel, *Department of Applied Mathematics and Computer Science, Weizmann Institute of Science, P.O. Box 26, IL-76100 Rehovot, Israel*
- P. Frankl, *Peter Frankl Office Ltd., 3-12-12 Shibuya, Shibuya-ku, Tokyo 150-0002, Japan*
- A.M. Frieze, *Department of Mathematics, Carnegie Mellon University, Pittsburgh, PA 15213, USA*
- I.M. Gessel, *Department of Mathematics, Brandeis University, P.O. Box 9110, Waltham, MA 02254-9110, USA*
- R.L. Graham, *University of California-San Diego, CSE APM, La Jolla, CA 92093-0114, USA*
- A. Hajnal, *Mathematical Institute, Hungarian Academy of Science, Reáltanoda u. 13-15, H-1053 Budapest, Hungary*
- F. Harary, *Department of Computer Science, New Mexico State University, Las Cruces, NM 88003, USA*
- D.M. Jackson, *Combinatorics & Optimization, University of Waterloo, Waterloo, Ont., Canada N2L 3G1*
- J. Kahn, *Department of Mathematics, Rutgers, the State University of New Jersey, Hill Center, Piscataway, NJ 08855, USA*
- G.O.H. Katona, *Matematik Kutató Intézet, Magyar Tudományos Akadémia, Reáltanoda u. 13-15, H-1053 Budapest, Hungary*
- D.J. Kleitman, *Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139, USA*
- A.V. Kostochka, *Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801-2975, USA*
- P. Leroux, *Département de Mathématiques et Informatiques, Université du Québec à Montréal, CP 888 Succ. A., Montreal, Quebec, Canada H3C 3P8*
- L. Lovász, *Microsoft Research, One Microsoft Way, Redmond, WA 98052, USA*
- A. Rosa, *Department of Mathematics, McMaster University, Hamilton, Ont., Canada L8S 4K1*
- I.G. Rosenberg, *Mathématiques et Statistiques, Université de Montréal, B.P. 6218, Succ. A., Montreal, Quebec, Canada H3C 3J7*
- S. Rudeanu, *Institutei de Matematica, University of Bucharest, Str. Academiei 14, 70109 Bucuresti, Romania*
- H. Sachs, *TH/Sekt. Mathematik, Rechentechnik und Kybernetik, Postfach 327, 98693 Ilmenau, Germany*
- J. Schonheim, *Department of Mathematics, Tel Aviv University, Ramat Aviv, Tel Aviv 69978, Israel*
- N.J.A. Sloane, *AT&T Research Labs., Room C233, P.O. Box 971, 180 Park Ave, Florham Park, NJ 07932-0971, USA*

C. Thomassen, *Mathematical Institute, Technical University of Denmark, Building 303, DK-2800 Lyngby, Denmark*

W.T. Trotter, *Department of Mathematics, Arizona State University, Tempe, AZ 85287, USA.*

D.J.A. Welsh, *Mathematical Institute, University of Oxford, 24–29 St. Giles, Oxford OX1 3LB, UK*

D.B. West, *Department of Mathematics, University of Illinois at Urbana-Champaign, 273 Altgeld Hall, 1409 West Green Street, Urbana, IL 61801-2975, USA*

R. Wille, *Fachbereich Mathematik, Technische Hochschule Darmstadt, Schlossgartenstrasse 7, 64289 Darmstadt, Germany*

D.R. Woodall, *Department of Mathematics, University of Nottingham, University Park, Nottingham NG7 2RD, UK*

H.P. Yap, *Department of Mathematics, National University of Singapore, Singapore 0511, Singapore*